African Centre of Meteorological Application for Development
Centre Africain pour les Applications de la Météorologie au Développement

Ten Day Climate Bulletin
N° 09
Dekad 21st to 31st March, 2010

HIGHLIGHT: The highest cumulative estimated rainfall was over GHA countries. The highest mean maximum temperature was recorded at Bamako-Senou in Mali while the lowest mean minimum temperature was observed at Bilma in Niger. The area with TI regime threshold value of 243°K is characterized by high conditional instability and will continue to experience heavy rains with floods particularly over the parts with relative humidity (>70%).

1. GENERAL SITUATION

Subsection 1.1 provides the strengths of the surface pressure systems, the ITD displacement while the subsection 1.2 on the Troposphere gives a brief on monsoon, thermal index regimes and relative humidity.

1.1 SURFACE

- **Azores high pressure**: of 1026 hPa with a SW-NE axis strengthened by 2 hPa and shifted southwest compared to the past dekad. Its centre was located at about 30°N/30°W extending a ridge over North Atlantic Ocean

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- **Libyan high** of 1023 hPa was located at about 28°N/19°E extending a ridge over north Niger, north Chad and northwest Sudan.

- **Saharan Thermal Low:** Pressure at 1008 hPa centred at about 14°N/13°W, filled up by 2 hPa and shifted westwards compared to the past dekad. Its trough extended over east Senegal, south Mali, Burkina Faso, Ghana, Togo, Benin, south Nigeria, north Cameroon and south Chad.

- **St. Helena high:** Pressure of 1027 hPa with a W-E axis strengthened by 2 hPa and shifted westwards compared to the previous dekad. Its mean position was at 35°S/08°W, extending a ridge over South Atlantic Ocean.

- **Mascarene high:** Pressure of 1028 hPa with a W-E axis strengthened by 4 hPa compared to the past dekad and shifted southwest. Its mean position was located at 35°S/72°E with an extended ridge over Indian Ocean.

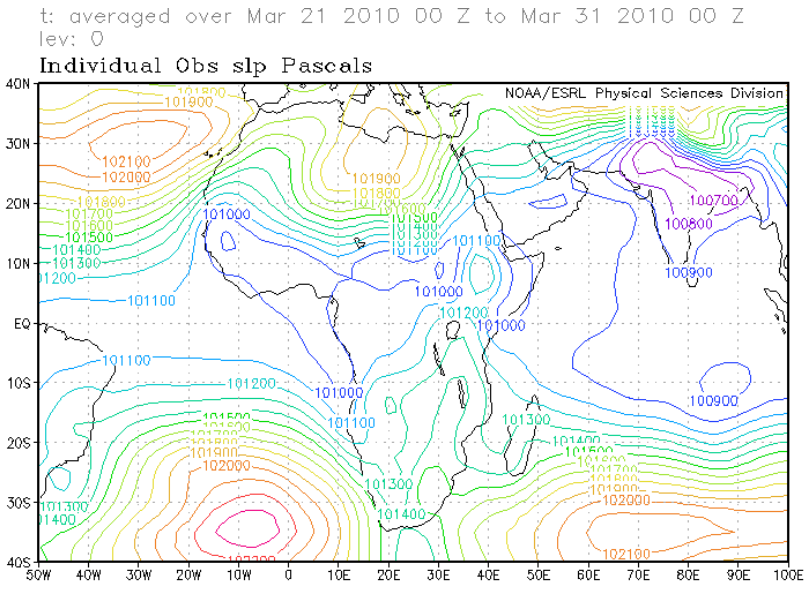

Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

- **Inter-Tropical Discontinuity (ITD)**

Between the second dekad (blue line) and the third dekad (black) of March, 2010, the ITD had a significant southward migration over east part of the Gulf of Guinea countries while over west part it shifted slightly northwards (Figure2).

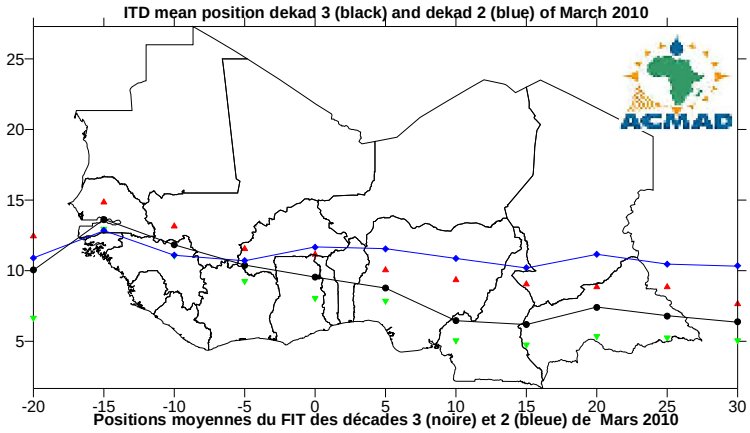

Figure 2: The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

1.2.1 Monsoon

Monsoon influx at 925hPa level was weak (1 to 5 m/s) over southwest Cameroon and moderate (5,5 to 12,5 m/s) over south Sierra Leone and south Nigeria during the dekad.

1.2.2 Thermal lndex (TI)

In the third dekad of March, 2010, the thermal index (TI) regime at 300hPa in (figure 3), had the threshold value of 243°K extending about 15°N and 20°S covering southern part of the Gulf of Guinea countries, central Africa, GHA countries and northern part of southern Africa countries linked to heavy rainfall with floods over areas with high relative humidity shown in Figure 4.

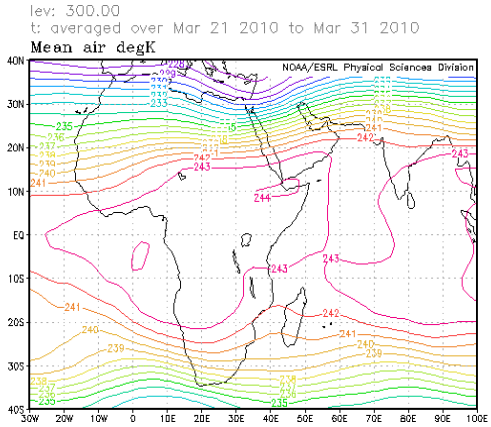

Figure 3: TI at 300hPa (Source: NOAA/NCEP)

1.2.3 Relative Humidity (RH)

The 850hPa (Figure 4) shows high RH (>70%) in the third dekad of March, 2010 over eastern and southern part of Central Africa, major part of GHA countries and eastern and northern parts of Southern Africa countries. The Sahara, the Sahel and northern part of Gulf of Guinea countries experienced dry conditions characterized by the lowest RH (>40%).

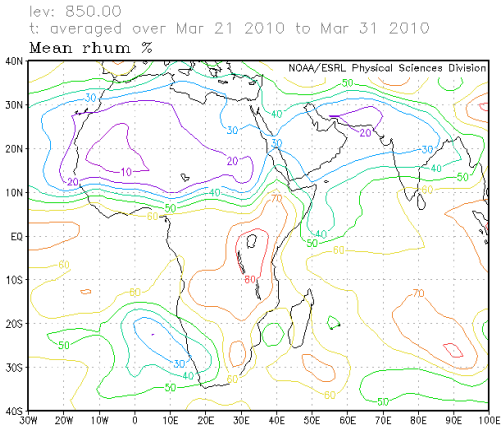

Figure 4 : RH at 850hPa (Source: NOAA/NCEP)

2. RAINFALL AND TEMPERATURE SITUATION

Subsection 2.1 provides a summary on estimated rainfall amounts and distribution while subsection 2.2 provides a Table showing stations' observed rainfall, number of rainy days, mean maximum and mean minimum temperatures.

2.1 RAINFALL

The rainfall estimate based on Satellite and Rain Gauge in Figure 5 below compared to that of the past dekad shows rainfall distribution decrease over Northern Africa, Gulf of Guinea and Central African countries while GHA and southern Africa countries had increased in rainfall distribution. The Sahel countries continued to be under the influence of the Harmattan. In detail:

- **North Africa countries:** had significant rainfall distribution and amounts decrease observing localized rainfall between 10mm to 20mm.
- **The Sahel:** continued to experience dry and dusty conditions under the influence of the Harmattan.
- **Gulf of Guinea countries:** experienced significant decrease in rainfall distribution and amounts; observing rainfall amounts ranging from 10mm to 50mm over the coastal areas with localized peaks of about 50mm to 100mm.
- **Central Africa countries:** had rainfall distribution decrease over he northern part, observing amounts ranging between 10mm to 150mm with maximum of about 200mm over Democratic Republic of Congo and Gabon.
- **GHA countries:** experienced significant increase in rainfall distribution and amounts, observing between 10mm to 150mm with localized peaks between 150mm to 250mm intensifying to about 300mm over southern Tanzania and Kenya.
- **Southern Africa countries:** had slight rainfall distribution increase, observing between 10mm to 100mm with maximum of about 200mm over the northern parts.

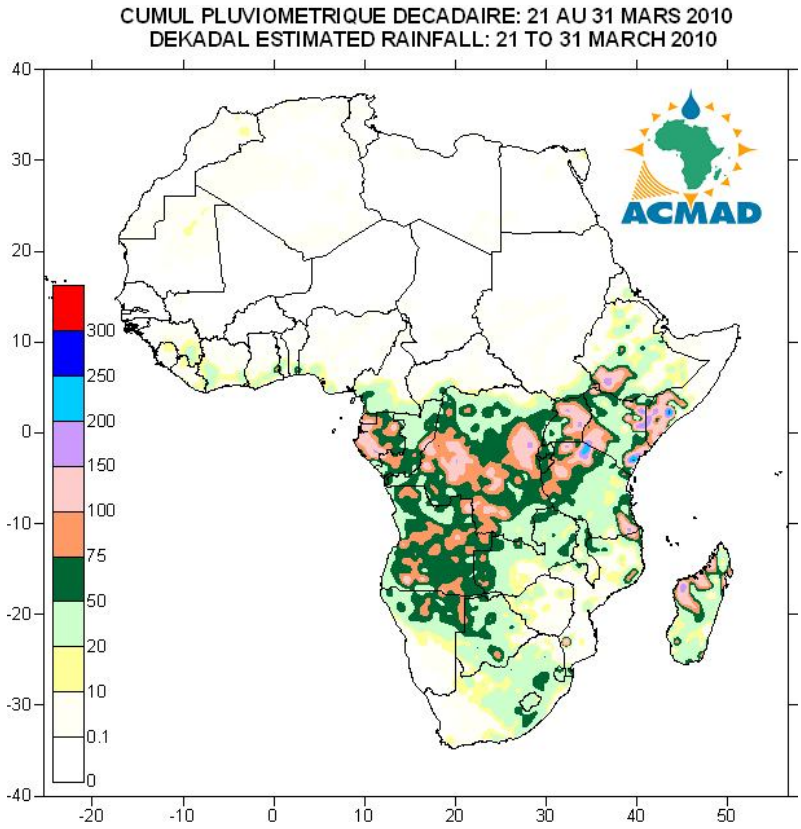

Figure 5 : Estimated precipitations, (Data Source: NOAA/NCEP)

2.2 OBSERVED DATA

The Table below shows the highest cumulative rainfall that was observed at Toalagnaro in Madagascar and Plaisance in Mauritius. The highest mean maximum temperature of 39.5°C recorded at Bamako-Senou in Mali while the lowest mean minimum temperature of 9.3°C was recorded at Bilma in Niger.

N°	STATIONS	Précipitations (mm)	Number of rainy days	Température Max mean (°C)	Température Min mean (°C)
1	Abidjan	0	0	33,8	27,7
2	Accra	0	0	33,7	27,1
3	Agadez	0	0	34,4	16,9
4	Alger (Dar El Beida)	0	0	22,1	10,7
5	Antananarivo	33	2	27,3	17,0
6	Antsiranana	8	4	31,7	23,3
7	Bamako-Senou	0	0	39,5	25,0
8	Bangui	19	1	-	23,3
9	Banjul	0	0	34,8	21,4
10	Beira	0	0	32,0	24,9
11	Bilma	0	0	34,3	9,3
12	Bobo Dioulasso	0	0	38,1	26,4
13	Brazzaville	60	4	32,4	23,1
14	Bujumbura	0	0	28,1	20,8
15	Bulawayo	18	3	-	16,1
16	Casablanca	3	1	20,3	14,6
17	Conakry	0	0	32,0	26,3
18	Cotonou	0	0	33,1	28,7
19	Dakar-Yoff	0	0	27,2	20,9
20	Dar-es-Salaam	4	1	-	22,9
21	Dodoma	11	1	-	-
22	Douala	0	0	32,3	25,4
23	Durban	1	1	29,3	21,6
24	Entebbe	0	0	24,9	19,5
25	Francistown	6	1	31,7	18,9
26	Ghanzi	86	5	29,9	18,9
27	Harare	3	1	26,9	17,1
28	Johannesbourg	50	5	23,8	15,3
29	Khartoum	0	0	33,7	21,0
30	Kigali	0	0	25,7	16,7
31	Le Caire	0	0	24,4	14,3
32	Le Cap	0	0	23,4	15,1
33	Libreville	81	4	31,3	24,2
34	Lilongwe	0	0	-	17,7
35	Lomé	0	0	34,1	27,3
36	Lusaka	0	0	29,2	17,9
37	Manzini	41	3	29,5	19,4
38	Maputo	34	1	32,2	23,5
39	Maseru	26	4	25,2	12,4
40	Maun	44	2	-	-
41	Monrovia	0	0	33,0	25,2
42	Moroni	0	0	31,7	24,7
43	Mtwara	32	1	-	-
44	Nairobi	57	3	26,0	14,9
45	Nampula	4	1	32,7	21,9
46	N'Djamena	0	0	37,5	20,0
47	Niamey-Aéroport	0	0	38,2	24,5
48	Nouakchott	0	0	38,7	22,6
49	Ouagadougou	0	0	38,9	24,3
50	Plaisance	100	11	29,8	24,0
51	Port Elisabeth	26	4	25,3	17,6
52	Pretoria	3	1	27,3	18,4
53	Sal	0	0	27,0	21,9
54	Seretse Khama- Aéro	4	3	30,0	19,5
55	Seychelles	46	5	31,7	25,8
56	Tamanrasset	0	0	29,4	14,2
57	Toalagnaro	112	4	29,9	24,0
58	Tombouctou	0	0	39,2	20,7
59	Tripoli	0	0	29,4	13,9
60	Tunis	0	0	24,0	13,2
61	Windhoek	1	1	31,0	17,0
62	Zinder	0	0	35,0	21,2

NOTE: **0** means no rain;
- means no temperature data available

Data Source: ACMAD / GTS

3. OUTLOOK FOR DEKAD (11th – 20th APRIL, 2010)

3.1 RAINFALL

The ITD will be expected to move northward while the dry and dusty conditions will continue under the influence of the Harmattan. The rainfall will intensify over southern part of the Gulf of Guinea, central Africa and GHA Africa countries. In detail**:**

- **North Africa countries:** will experience decrease in rainfall amounts ranging from 10mm to 100mm.
- **The Sahel:** will continue to experience high temperature with dry and dusty conditions under the influence of the Harmattan.
- **Gulf of Guinea countries:** will experience rainfall increase over western part observing amounts ranging from 10mm to 75mm with peaks of about 100mm.
- **Central Africa countries:** will experience rainfall increase with amounts ranging from 20mm to 150mm with peaks ranging from about 200mm to 300mm resulting in flooding.
- **GHA countries:** will have rainfall increase with amounts ranging from 10mm to 150mm intensifying over some parts with amounts ranging from about 200mm to 300mm resulting in severe flooding.
- **Southern Africa countries:** will experience rainfall decrease with amounts ranging from 10mm to 75mm with peaks of about 100mm.

3.2 TEMPERATURE

The forecast in Figure 7, shows high temperature in parts of Gulf of Guinea, the Sahel, northern central Africa and parts of GHA countries. The high temperatures ranging from 20°C to 35°C will cover more than 75% of the Continent.

3.3 SOIL MOISTURE

The outlook on soil moisture change, maps shown in Figure 8 include the initial soil moisture and the forecast changes over the next 7 days. The soil moisture change and precipitation relationship is discernable on the maps below. The areas forecast to have high soil moisture change increase include Gulf of Guinea countries, central Africa countries, parts of GHA, northern and north eastern parts of southern Africa countries while significant soil moisture change deficits will dominate southern parts of central Africa, parts of GHA and major part of southern Africa countries.

3.4 IMPACTS

Health: The incidences of malaria and other climate related diseases are higher in areas with high temperatures during rainy period. The temperatures in the range of 18°C to 32°C with high rainfall and relative humidity (>60%) favour the survival of the vector and development of the parasite in the vector resulting in high incidences of malaria even in low prevalence areas. Some parts of the Gulf of Guinea, central Africa, GHA and parts of southern Africa countries with high humidity/rainfall coupled with prevailing conducive temperatures will support the survival of parasite resulting in higher incidences of malaria including other climate related diseases. The Harmattan dust will result in increased cases of meningitis and other dust related ailments over the Sahel and parts of the Gulf of Guinea countries. The health authorities and Agencies need to continue the healthcare and humanitarian services to protect lives of the vulnerable communities.

Agriculture and food security: The integration of climate prediction products and information into agricultural production and food security is of crucial importance. We emphasize on the importance of suitable planting dates, seasonal rainfall onset, rainfall performance and duration including monitoring of the phenological stages of crops for crop yield assessments in the countries. It is imperative to carry out cost benefit analysis on applications of appropriate planting dates and suitable seed variety in order to take full advantage of limited soil moisture availability in a shortened crop growing season. The drought-tolerant crops can be grown in zones where the prevailing soil moisture is the major climate constraint on crop yield. The crop varieties that are higher yielding, more drought resistant, earlier maturing, disease and pest tolerant are recommended in these moisture constrained zones for communities' sustained food security and adaptation. There is also a need to invest in higher yielding crops during a good rainy season

by taking advantage of seasonal climate consensus forecasts, for example those issued by regional climate outlook forums (RCOFs), the GHACOF, PRESAO, PRESAC, and SARCOF for Greater Horn of Africa (GHA) countries, West Africa countries/Chad/Cameroon, central Africa and southern Africa countries respectively. The GHACOF25 has issued the seasonal climate consensus forecast for March-April-May, (MAM), 2010 for GHA countries.

African Ecosystems: While noting that forests serve as rainfall catchment areas, the destruction of forests has been blamed for the declining water levels in the African lakes, rivers and the drying wetlands. We have to rehabilitate our presently degraded rainfall catchment areas and natural ecosystems through enhanced national policies and environmental reclamation strategies. Good practices in ecosystems rehabilitation and management include national tree planting during rainy season and soil conservation to minimize soil loss during rainy seasons due to heavy runoff**.** Enhanced national strategies and policies for adaptation to Climate Change are of highest priority for States' enhanced economic growth and the achievement of the United Nations millennium development goals (MDGs) for sustainable development. The countries have to invest in environmental conservation now for better tomorrow**.**

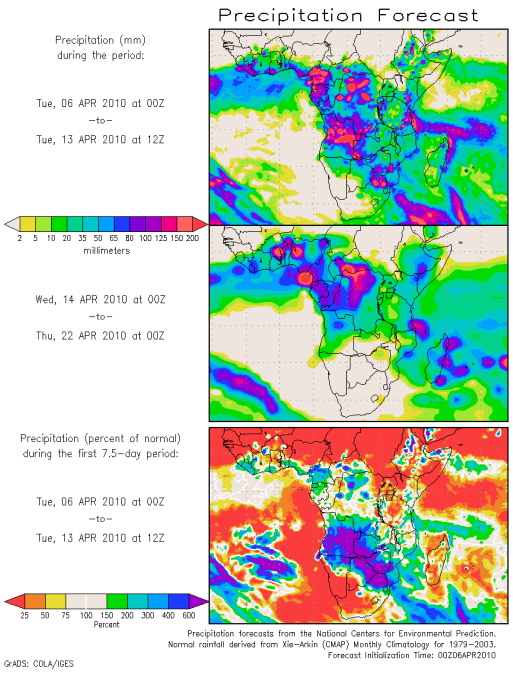

Figure 6 : Precipitation forecast, Source : COLA

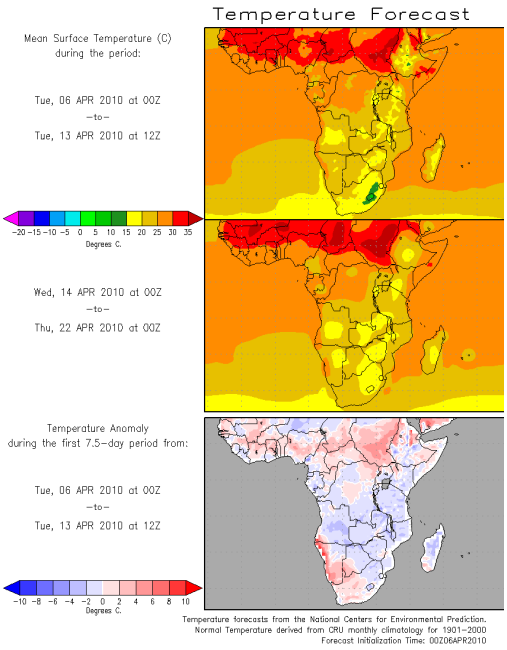

Figure 7 : Temperature forecast Source : COLA

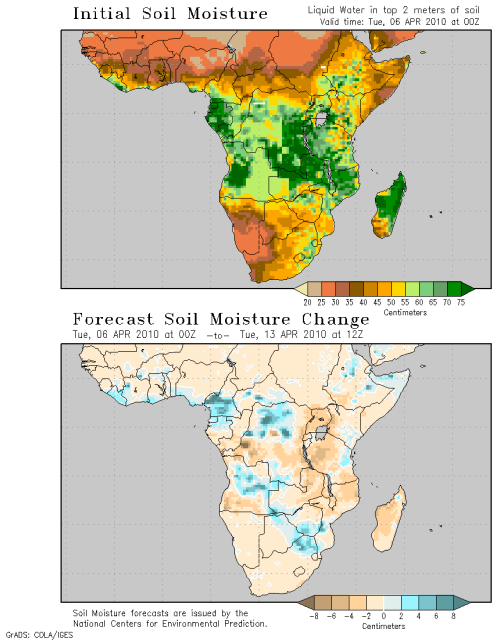

Figure 8 : Soil moisture forecast, Source: COLA

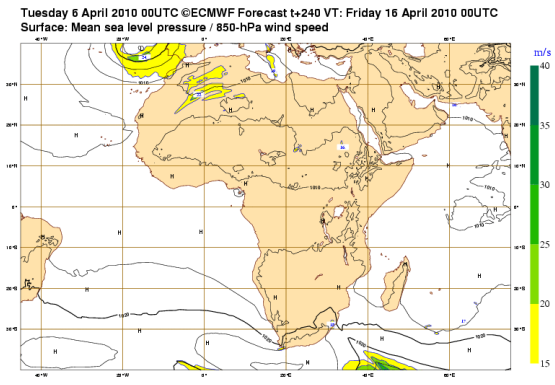

Figure 9 : Mean Sea Level pressure forecast Source: ECMWF